



Institut des Sciences et Techniques Appliquées
Université des frères Mentouri Constantine 1



Internship proposed by
SM WELD under the Erasmus + program



Erasmus+

Host institution:
Society of Metallic, Naval and
Industrial Constructions
SOCOMENIN



Internship Report



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APPRECIATION

In life, there are many constraints, but Almighty God makes us meet people in order to move forward and forward, so I extend my thanks and gratitude:

To the ERASMUS program

for having financed this internship which was very useful for us to deepen our knowledge in the field of mechanical manufacturing.

To Messrs. GHRIBI and GARGOURI

We were under your responsibility during these 2 months, thank you for your presence, your involvement and your sympathy, know that it helped us a lot.

To everyone help us in our mission in the company, especially the engineers in the engineering department.

Not forgetting Mahdi, the trainee, who sacrifice all what he has just to help us, not just inside the company but outside it too by showing us the city.

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Chapter I

“General Introduction”

As part of the exchange program for students and teachers between the universities, ERASMUS and the SM WELD project, the Director of the Institute of Applied Science and Technology (Institut des Sciences et techniques appliquées ISTA in “French”) choose the four promotion major students to do an internship within SOCOMENIN which is considered one of the leaders in North Africa in her field.

This internship aims to strengthen the links between universities and companies as well as to deepen the student’s knowledge in the mechanical field in order to accentuate their training.

Chapter II

“Company presentation”

1. General Presentation

SOCOMENIN is an Engineering, Industrial construction & Maintenance Company created in 1975. Its name is an abbreviation of “**S**ociété de **C**onstruction **M**étallique **N**avale et **I**ndustrial” (in French), in English it’s a shipbuilding and industrial metal construction company. Its Head quarter is located in SFAX, Tunisia.

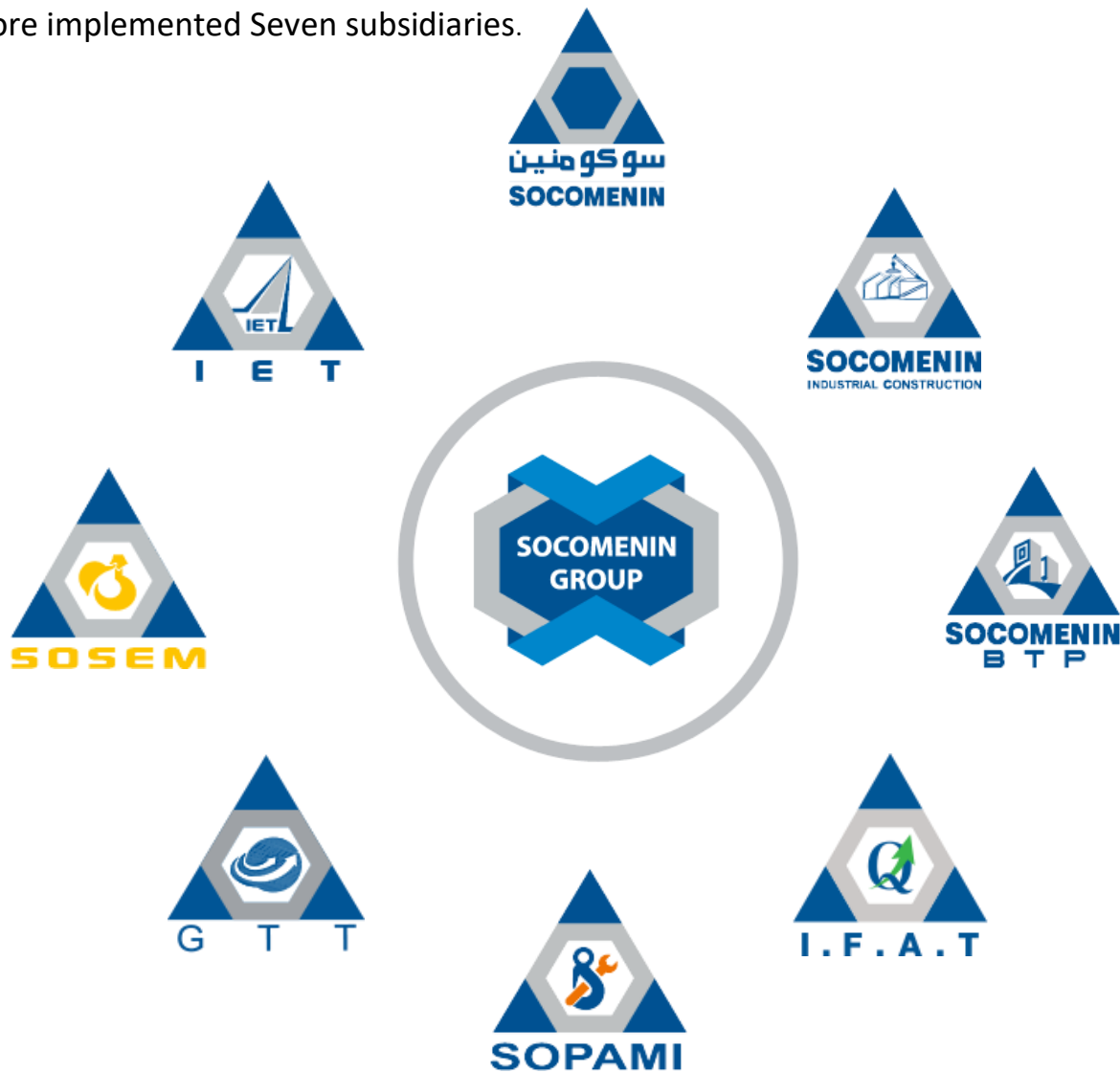
The company succeeded in establishing excellent relationships with many local and international well know companies. Today, SOCOMENIN is one of the leading companies in steel fabrication, industrial construction and maintenance activities in the Great Maghreb region.

Since 1975, SOCOMENIN has been involved in the field of steel equipment manufacturing and construction of industrial plants on an EPC basis. Its activities have always focused on customer satisfaction and constant improvement of products and services quality.



1.1. SOCOMENIN GROUP

SOCOMENIN has developed its activities to meet its customer's requirements and has therefore implemented Seven subsidiaries.



- **IET:** Industrial Engineering Technologies. (Eng.)
- **SBTP :** SOCOMENIN Bâtiments et Travaux Publics. (Fr) / SOCOMENIN Buildings and public works.
- **IFAT :** Ingénierie de la Formation et Assistance Technique. (Fr) / Training Engineering and Technical Assistance.
- **GTT:** Global Tunisian Trade. (Eng.)
- **SOPAMI :** SOCOMENIN Pilotage, Assistance technique & Maintenance Industrielle. (Fr) / Pilotage, Technical Assistance & Industrial Maintenance
- **SOSEM :** Société de Service Et de Montage. (Fr) / Service and Assembly Company.
- **SIC :** SOCOMENIN Industrial Construction. (Eng)

1.2. Internal Organisation

SOCOMENIN as a privet company has a descendant hierarchical structure, which is summarized on this flowchart:

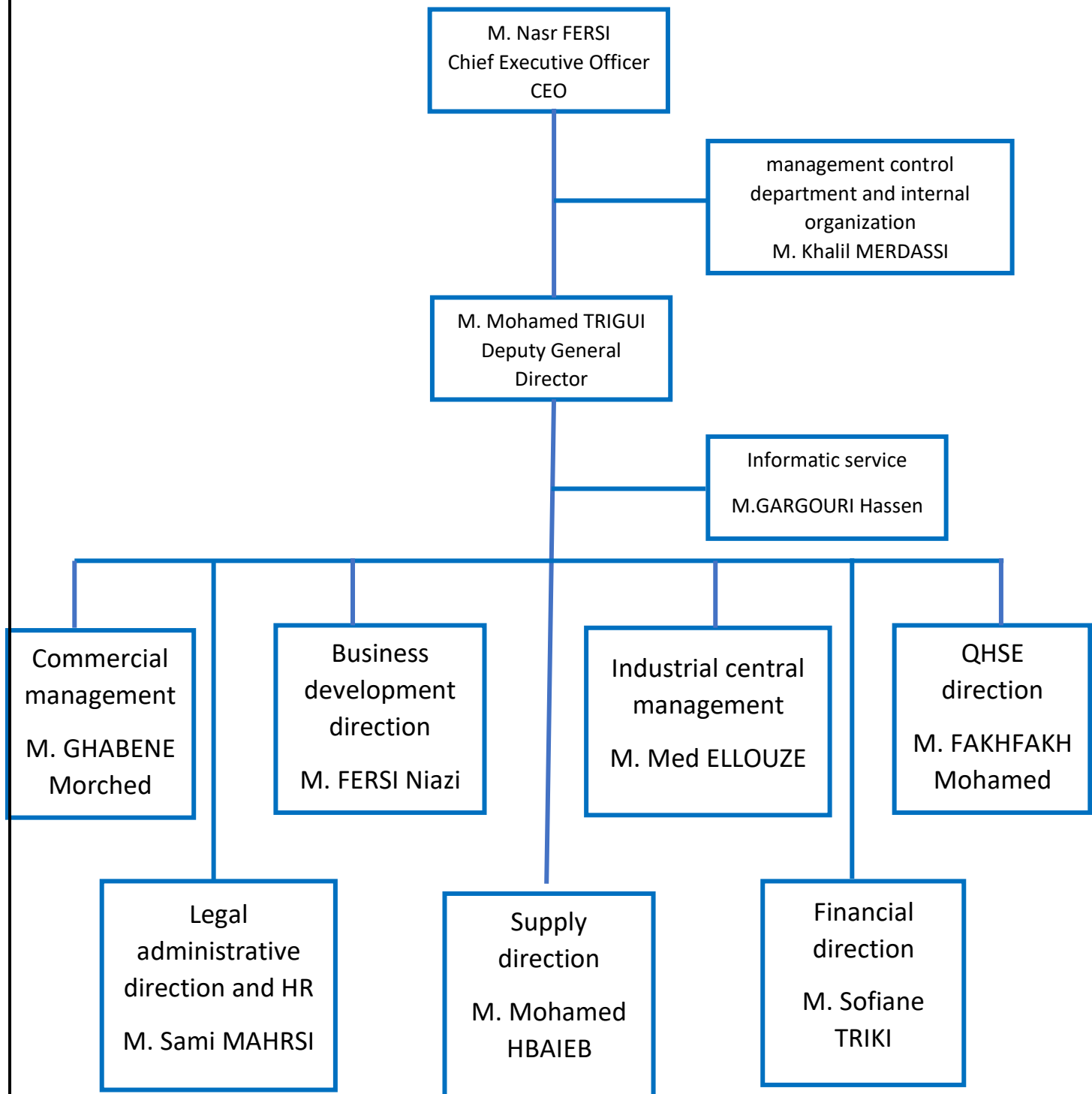


FIGURE 1 : HIERARCHICAL STRUCTURE OF SOCOMENIN COMPANY

1.3. SOCOMENIN Activities

1.3.1. Engineering:

SOCOMENIN offers Engineering and design services related to EPC (Engineering, Procurement and Construction) Projects and Process equipment manufacturing covering:

- Basic Engineering: Mechanical, Electrical, Civil Engineering works...
- Detailed engineering: Structural, Instrumentation, Mechanical, Piping layout...

SOCOMENIN is using CAD/CAE Design software packages that enable delivering high quality designs to customers.

Design tools

Drawing	Software	Steady state and transient hydraulic analysis	Flexibility analysis and stress calculation	Steel structure and concrete steel design software	Steel structure detailed design	Finite element analysis
AutoCAD /SP3D Solid works/ pressure vessel design	PV ELITE Atmospheric storage tank design	WANDA Piping	CAESAR II	ROBOT	X-STEEL	COSMOSWORKS/ COSMOS

1.3.2. Manufacturing

SOCOMENIN is one of the leading steel equipment manufacturing companies in North Africa.

SOCOMENIN is specialized in the following products:

- Pressure vessels: Columns, Separators....
- Storage tanks
- Pipe racks, Manifolds and piping
- Steel Structures
- Wind towers



1.3.3. Construction

Since its creation, SOCOMENIN was involved in large projects in North Africa. Its high level of expertise and project management and construction capabilities, combined with a responsive organizational structure and a policy of forging partnerships with local and international companies, has enabled SOCOMENIN to provide solutions that are both global and modular to meet the wide-ranging needs of customers, from project management to the provision of turnkey projects.

SOCOMENIN has a large experience in project construction in different field of activities from engineering to commissioning and start up. Its main construction projects include:

- Storage tanks
- Separation Units
- Pumping stations
- Chemical processing plants
- Cement Factories
- Food Factories
- Oil and Gas processing plants
- Power Generation Plants
- Desalination Units
- Fertilizer plants
- Iron and steel plants



1.3.4. Wind Tower

SOCOMENIN Wind Towers Division is specialized in the fabrication of tubular steel towers for the wind energy industry.

In Its plant dedicated to serial production of wind towers, it can produce 12000 t/year of wind towers and this up to 6000 mm in diameter with high accuracy geometric tolerances. Towers are delivered as a package surface treated including assembly of internals.



1.4. QHSE “ Quality, Hygiene, Security, Environment”

SOCOMENIN has very strictly ensured that only conform products are delivered to its customers. SOCOMENIN’s Quality Department performs in-house inspection and testing of all products along the manufacturing processes starting from the reception of raw materials up to the finished product.

SOCOMENIN considers that each order is a specific project for which a Quality inspector team is assigned and a Quality plan is systematically prepared.

Talking about the Quality, SOCOMENIN has been certified its Quality Management System according to **ISO 9001:2008**, and its fusion welding quality requirements according to **ISO 3834-2:2005**.

In order to enter the SOCOMENIN product in the international market, it must be conformed and certified. So SOCOMENIN now hold **ASME BVP “U”, “U2”, “S” and “R”** and it is certified to supply CE marked pressure vessels.



Talking about the **HSE** “Hygiene, Security, Environment”, SOCOMENIN HSE policy is making sure to:

- Provide adequate control of the health and safety risks arising from its work activities;
- Consult with its employees on matters affecting their health and safety;
- Provide and maintain safe plant and equipment;
- Ensure safe handling and use of substances;
- Provide information, instruction and supervision for employees;
- Ensure all employees are competent to do their tasks, and to give them adequate training;
- Prevent accidents and cases of work-related ill health;
- Maintain safe and healthy working conditions.



CHAPTER III

“OUR INTERNSHIP MISSION”

1. Introduction

Due to our internship mission in the company which it will be mentioned below, SOCOMENIN's responsible has made for us a program to guide us in our visit to the different department in the company, starting with the engineering department, passing from the commercial department, finishing by the construction department.

Just to make our mission there easy to be accomplished and due to the company schedule, we get split to two groups.

2. Internship mission

2.1. At the commercial department:

As we know, before any construction of any product which is proposed by the customer, that last one always asks the company to make him a detailed card which contains all the product's components with all their detail including weight, area, unit price, shipping price...etc. Finishing by the total amount of the final product.

So, the commercial department is the responsible of all these calculation and process, but before it starts its job, it must have the most important thing in this department, which is DATABASE.

Our first mission here, was to create and develop a dynamic database for steel, tube prices and all the elements that the company build with all their details.

part	length	height	width	thickness	amount	Volume	unit weight	weight AC1	weight AC2
AUG 1	2146	382	150	6	2	4918632	38.61	77.22	/
AUG3	1690	382	150	6	3	3873480	30.41	91.22	/
AUG4	4575	382	151	6	3	10485900	82.31	/	246.94
PLAT2	4710	/	2228	20	1	209877600	1647.54	1647.54	/
PLAT3	4710	/	2520	20	1	237384000	1863.46	/	1863.46
Bandeau B1	1870	/	230	10	1	4301000	33.76	33.76	/
Bandeau B2	4665	/	175	10	1	8163750	64.09	64.09	/
Bandeau B2X	4665	/	175	10	1	8163750	64.09	/	64.09
Bandeau B3	322	/	160	10	1	515200	4.04	4.04	/
Cadre A12	4260	/	280	10	1	11928000	93.63	93.63	/

Cadre S2	4260	/	150	10	1	6390000	50.16	50.16	/
Cadre A13	4710	/	280	10	1	13188000	103.53	103.53	/
Cadre S13	4710	/	150	10	1	7065000	55.46	55.46	/
PL1	330	/	220	20	1	1452000	11.40	11.40	11.40
PL5	115	/	90	10	2	103500	0.81	/	1.62
LATT céramique	30	/		5	1	150	0.00	0.00	0.001178
Entretoise A4	1690	/	280	10	1	4732000	37.15	37.15	/

Secondly, we moved to the development of worksheets and cost estimation of pressure tanks according to the standard **ASME VIII**, like it showed below.

Finally, we finished by the development of worksheets and cost estimation of storage bins according to the standard **API 650**.

REF	Part	Thicknes s	Material		Weight (Kg)	Amoun t	T Weight
5-6570-10645726	LIFTING PLATE	15			2.22	3	6.66
5-0100-10645744	GUSSET PLATE	12			3.02	2	6.04
6-3060-10646433	SEAL	3	C-4400		0.58	5	2.9
5-7830-10646443	FLANGE	15	1.4539	904L	34.33	8	274.64
5-7830-10646444	FLANGE	12	1.4539	904L	29.93	5	149.65
5-0100-10646451	SHEET	6	1.4539	904L	395.07	5	1975.35
5-0100-10646452	SHEET	6	1.4539	904L	409.28	4	1637.12
5-7830-10646477	FLANGE	8	1.4571	316Ti	8.24	5	41.2
5-0100-10646489	SHEET	6	1.4539	904L	158.96	1	158.96
5-0100-10646491	SHEET	5	1.4539	904L	32.74	1	32.74
5-0100-10646492	SHEET	6	1.4539	904L	173.18	1	173.18
5-0100-10646495	SHEET	12	1.4571	316Ti	10.5	1	10.5
5-0100-10646496	SHEET	12	1.4571	316Ti	4.14	1	4.14
5-0100-10646497	SHEET	12	1.4571	316Ti	14.16	1	14.16

5-0100-10646498	SHEET	12	1.457 1	316T i	16.99	2	33.98
5-0100-10646499	SHEET	12	1.457 1	316T i	7.85	1	7.85
5-0100-10646521	SHEET	12	1.457 1	316T i	3.83	1	3.83
5-0100-10647225	SHEET METAL	12	1.457 1	316T i	2.27	1	2.27
5-0100-10647445	SHEET METAL	12	1.457 1	316T i	3.25	1	3.25
5-0100-10647450	SHEET METAL	8	1.457 1	316T i	0.32	3	0.96
6-4970-10647451	CLAMP FO DN300	8	1.457 1	316T i	2.32	1	2.32
5-0010-10647461	PIPE	7.5	1.457 1	316T i	23.86	10	238.6
5-6570-10647661	PLATE	15			6.97	1	6.97
5-7830-10647662	FLANGE	15	1.453 9		70.14	1	70.14
5-0100-10647663	SHEET METAL	15			16.46	5	82.3
5-0100-10647669	SHEET METAL	12	1.457 1	316T i	2.03	1	2.03
5-0100-10648114	SHEET METAL	5	1.453 9	904L	81.56	1	81.56
8-1610-10648338	PIPE DN65	2.9	1.453 9	904L	0.66	1	0.66
5-0010-10648364	FITTING DN 15- G1/2	5.7	1.453 9	904L	0.14	1	0.14
5-0100-10648706	SHEET METAL	8	1.457 1	316T i	3.17	1	3.17
5-0100-10648707	SHEET METAL	8	1.457 1	316T i	1.97	1	1.97
5-0100-10648711	SHEET METAL	8	1.457 1	316T i	0.88	1	0.88
5-0100-10648807	SHEET METAL	8	1.457 1	316T i	26.96	1	26.96
5-0100-10648808	SHEET METAL	8	1.457 1	316T i	26.96	5	134.8
5-0012-11008025	BUSHING G1/2				0.32	1	0.32
5-0012-11008069	PIPE DN15	4	4.456 2		0.15	1	0.15

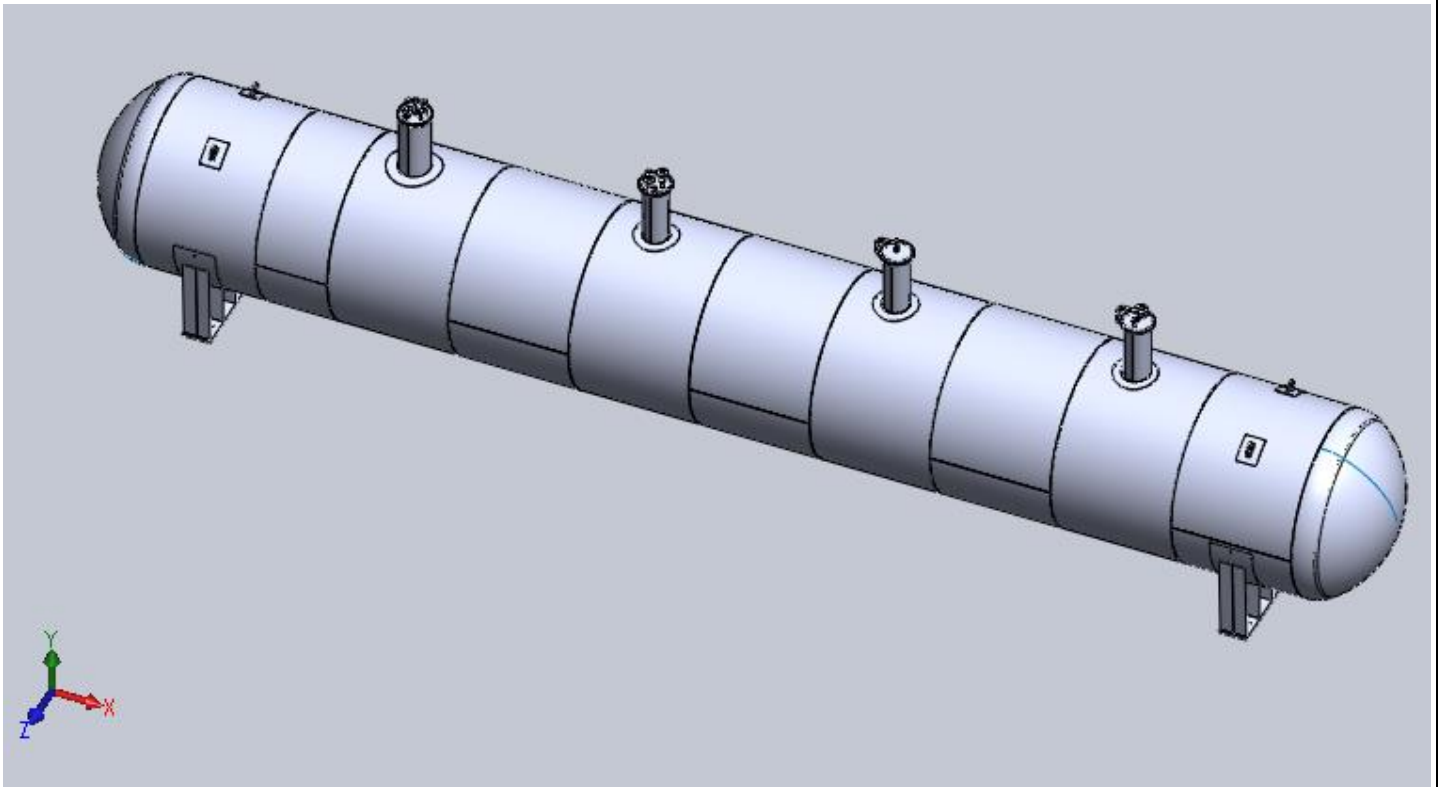
2.2. At the engineering department:

The engineering department as we all know, is a group of engineers with different title like designer, engineer office manager...etc. Their work is to provide a detailed 2D or 3D design for all income product, not just that but also suggest any modification or improvement in the product. Here in SOCOMENIN, as it mentioned earlier, they manufacture pressure vessel, storage tanks, steel structure... And to design all those products they need a several design software like SOLIDWORKS, Tekla structure, AutoCAD and all the rest CAD/CAE software.

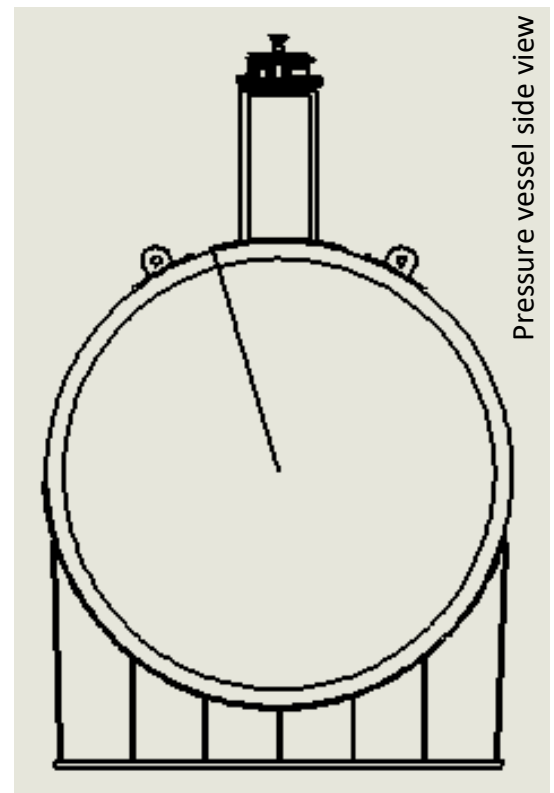
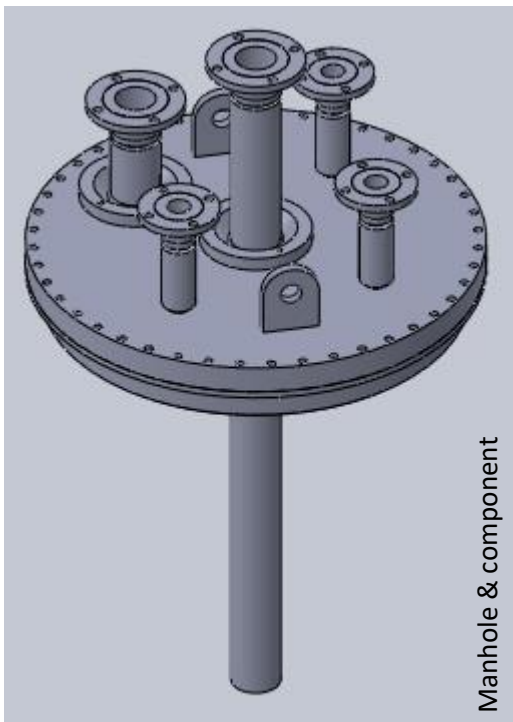
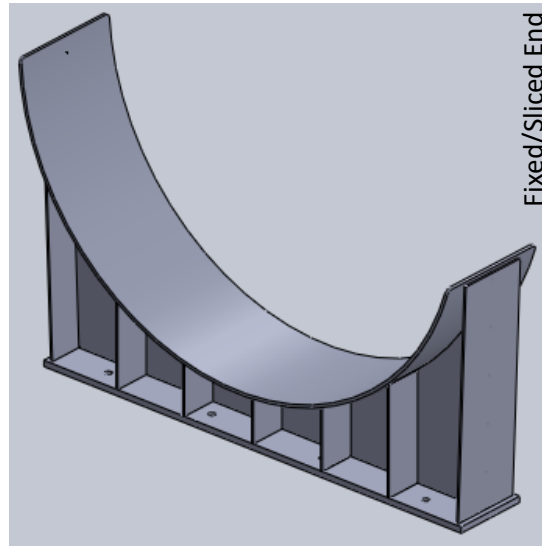
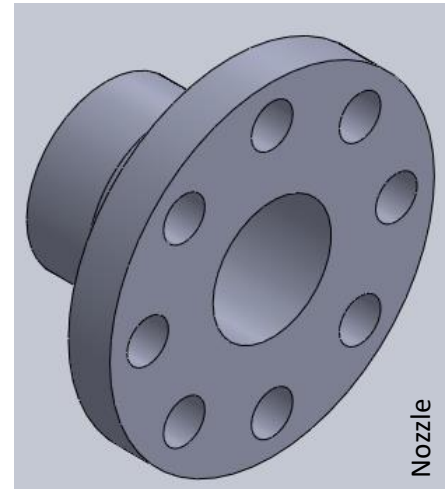
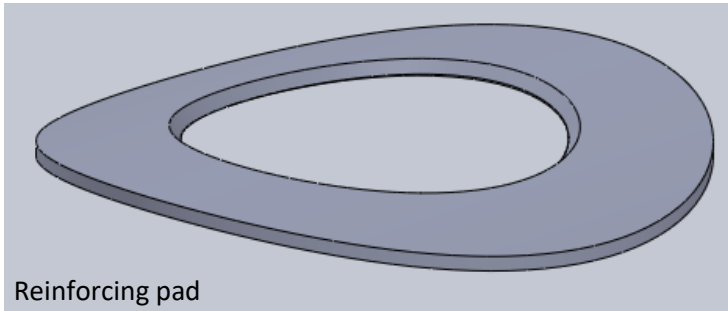
So, in purpose to get a maximum of information from those engineers, we devise our time to the two basics software:

- a. **SOLIDWORKS**, by designing a pressure vessel from scratch to the end, which help us to get familiar with new methods in designing round sheet metal, get some more basic advices from the engineers and help us to fix our issue and upgrade our knowledge in using this software.

Our SOLIDWORKS work:

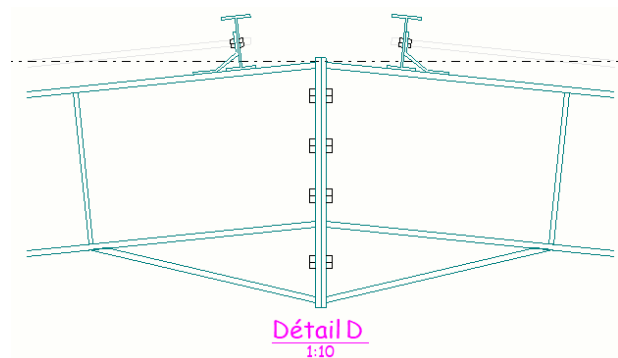
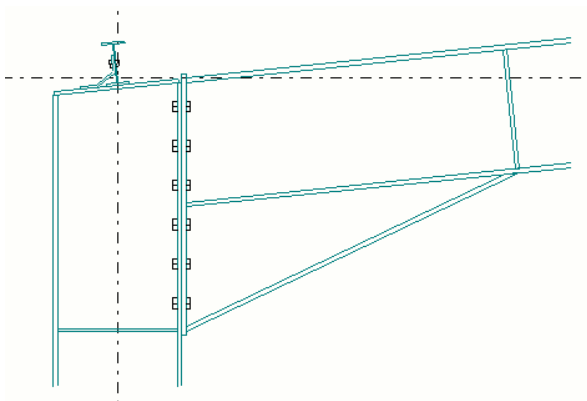
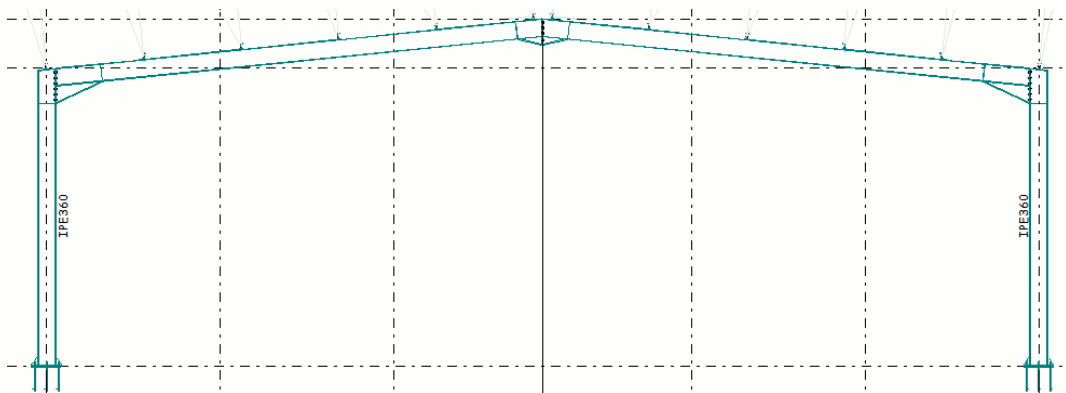
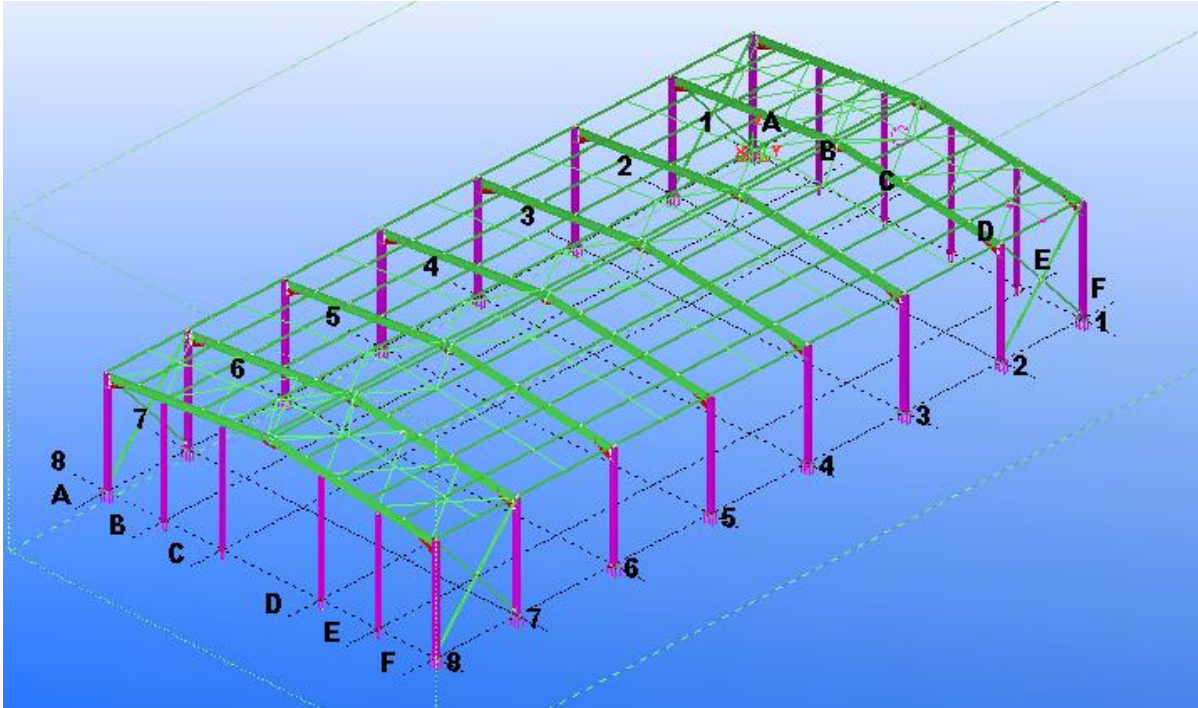


And here some part's 3D drawing:



- **TEKLA STRUCTURE**, for this software which is made to create and design steel structures, it is our first time that we work on it, so in the first we found some problems and difficulty. But with the help of the engineers we finally design and create a steel structure, and discover that we just needed some practice, nothing more.

Our TEKLA STRUCTURE work:



2.3. At the construction department:

In this department, we just take a discovering tour in the field because it is difficult to work here especially that we don't have any experience in welding field but all of that doesn't stop us from getting in the workshops to ask questions and know more about this domain.

2.3.1. Main Workshop:

SOCOMENIN production division has five carbon steel work plants and one stainless steel work plant which are located 200m away from the Sfax commercial port, which makes the sizeable items transportation easier from the sea than earth transportation.



Automatic
plasma
cutting

Automatic
plasma
cutting



2.3.2. Coating section:

a. Three Grit Blasting Work shops



In order to Keep-up with the new technologies, and to improve the if its products. SOCOMENIN Company has established two new blasting booths using metallic girt with 300 000 m²/year capacity.

The three-blasting booth are built according to international standards specifications for on-shore and off-shore use, and respecting the specific conditions of humidity which could controlled and the salinity that could be fixed down to 3μg/cm².

b. Six painting work shops

The painting activity is done in 6 conditioned buildings according to the international standards and paint manufacturer's specifications for onshore and offshore use. Specific conditions, such as humidity and temperature are closely controlled.

These buildings are equipped with air heater generators used in the winter, it allows our company to improve its productivity and quality of painting process.



c. Storage, Handling and delivery section

SOCOMENIN has a big park of mobile cranes with lifting capacity between 30T and 180T. It also has 40000m² of finished product storage area located at 200m away from Sfax commercial port, which is an advantage for sea transport.



Raw material storage zone

SOCOMENIN storage area is located 300Km away from Algerian and Libyan borders, this gives SOCOMENIN an advantage for the delivery of its products by trucks



Finished product storage area

Chapter IV

Conclusion

As part of this internship report, a detailed description of the company was made, then a report of the visit of the various sites of SOCOMENIN was established. And in the end the sequence and the chronology of the tasks carried out within the sales department.

This internship interested me a lot, I could visit the various services and departments of SOCOMENIN and have a global overview of its operation. It also allowed me to familiarize myself with the different services and to have a real approach to the world of work. I was able to make the connection between what I learned at the university and what really happens to the company during the general visit.

This internship was an opportunity for me to be integrated into the world of work, and feel the responsibility of the work that I do and how to manage it. And how one can gain the respect of others by the seriousness and the quality of his work.

It was not only a fruitful professional experience, but also a life experience, which allowed me to discover another great country and to know a new mentality.